

Date: Friday, 05/01/2007 11:29:45 AM
User: Linda Lacelle

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: HIGH AFT X-TUBE 412
Job Number	: 30186		
Estimate Number	: 10559		
P.O. Number	: N/A	Part Number	: D412664203
This Issue	: 05/01/2007 S.O. No. : N/A	Drawing Number	: D412-664-243 REV C
Prsht Rev.	: NC	Project Number	: N/A
First Issue	: N/A Type : LANDING GEAR	Drawing Revision	: C
Previous Run	: 29105	Material	: N/A
Written By	: _____	Due Date	: 15/02/2007 Qty: 1 Um: Each
Checked & Approved By	: _____		
Comment	Est Rev:E 04.02.16 Reformat; Added D3189-1 K/DS Est Rev:F 06-03-29 Remove Coments on Pick List JLM est rev G 06.12.08 per ECN 886 EC		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
1.0	DC	DOCUMENT CONTROL
	Comment: DOCUMENT CONTROL Photocopy bluefile and create labels as per PPP D412-664-203 CHG 005	
2.0	D6009129	Crosstube Material
	Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s) Pick: Qty Part number Description Batch 1 D6009-129 Crosstube <u>25668</u> Check OD = 3.500"; ID = 2.250"	
3.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE
	Comment: MORI SEIKI CNC LATHE LARGE 1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA166 2-Turn first side as per Folio FA166 3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-243.	
4.0	QC1	INSPECT ALL DIM TO DIM SHEET
	Comment: INSPECT ALL DIM TO DIM SHEET	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Mfg / Design Mgr	Approval QC Inspector

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Design Mgr	Approval QC Inspector
			Initial Design Mgr	Action Description Design Mgr	Sign & Date			
08.01.09	3	Chatter on tapered section of tube. (Both sides)	UP 07.01.10 PV QSI 042	cutting speed reduced. Tube to be buffed, re- measured + verified with engineering. PART OK PER ATTACHED ANALYSIS	TBG 07.01.09	[Signature] 07.06.09	UP 07.01.10 PV QSI 042	[Signature] 07.01.09

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

NOTE: Date & initial all entries

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Job Number: 30186

Part Number: D412664203

Job Number:



Seq. #:	Machine Or Operation:	Description :
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5.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE
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Comment: MORI SEIKI CNC LATHE LARGE

1-Turn second side as per Folio FA166

2-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-243.

3- Remove sand and plugs

4-Scribe part # and batch # using vibrating stylus as per Dwg D412-664-243
engrave on outside of tube)

Inside of Cuff(Donot

36 07.01.09 1

6.0	QC1	INSPECT ALL DIM TO DIM SHEET
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Comment: INSPECT ALL DIM TO DIM SHEET

36 07.01.09 1

7.0	QC8	SECOND CHECK
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Comment: SECOND CHECK

MB 07/01/22 1

8.0	LANDING GEAR 1	LANDING GEAR RESOURCE 1
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Comment: LANDING GEAR RESOURCE 1

1-Polish entire outside surface of crosstube

DP/7-1-22 ①

9.0	QC5	INSPECT WORK TO CURRENT STEP
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Comment: INSPECT WORK TO CURRENT STEP

DP 7-1-22

10.0	HAND FINISHING1	HAND FINISHING RESOURCE #1
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Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

DP/5D 7-1-22 ①

11.0	QC3/5	INSPECT WORK/WING WALK
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Comment: Inspect work & Chemical conversion Coat

7-1-22

W/O:		WORK ORDER CHANGES					
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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Design Mgr	Approval QC Inspector
			Initial Design Mgr	Action Description Design Mgr	Sign & Date			
















Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

NOTE: Date & initial all entries

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Process Sheet

Customer: CU-DAR001 Dart Helicopters Services		Drawing Name: HIGH AFT X-TUBE 412	
Job Number: 30186		Part Number: D412664203	
Job Number:			
Seq. #:	Machine Or Operation:	Description :	
12.0	BENDING	BENDING MACHINE	
			
Comment: BENDING MACHINE Bend tube as per Dwg D412-664-243 using CNC bender program 412-af and Folio FT010			
13.0	QC6	DIMENSIONAL CHECK	
			
Comment: DIMENSIONAL CHECK			
14.0	LANDING GEAR 1	LANDING GEAR RESOURCE 1	
			
Comment: LANDING GEAR RESOURCE 1 1-Drill pilot holes in tube as per Dwg D412-664-243 using drill Jig DT8550 & DT8551 2-Ream hole to finish size in tube as per Dwg D412-664-243 using drill Jig DT8550 & DT8551. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes. 3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-243			
15.0	HAND FINISHING1	HAND FINISHING RESOURCE #1	
			
Comment: HAND FINISHING RESOURCE #1 Chemical Conversion Coat as per QSI 005 4.1			
16.0	QC3	INSPECT POWDER COAT/CHEMICAL CONVERSION	
			
Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION			
17.0	QC5	INSPECT WORK TO CURRENT STEP	
			
Comment: INSPECT WORK TO CURRENT STEP			
18.0	OUTSIDE SERVICE	OUTSIDE SERVICES	
			
Comment: Sub-Contracting OUTSIDE SERVICES Liquid Penetrant Inspection as per QSI 038Or Issue P/O: 3908 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order			

W/O:		WORK ORDER CHANGES					
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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Design Mgr	Approval QC Inspector
			Initial Design Mgr	Action Description Design Mgr	Sign & Date			

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Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: HIGH AFT X-TUBE 412

Job Number: 30186

Part Number: D412664203

Job Number:



Seq. #:

Machine Or Operation:

Description :

19.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage

Ensure copy of NDT results attached to work order.

07/06/07

20.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: Inspect for damage & ensure results are as per Dwg D412-664-203

06-11

21.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube with White Imron as per QSI 005 4.2

8T 07-07-03

22.0

QC14

Inspect Spray Paint



Comment: Inspect Spray Paint

Wrap in plastic bag to protect from scratches

ml 07 07 04

23.0

D2856600

Abrasion Strip



Comment: Qty.: 1.7640 f(s)/Unit Total : 1.7640 f(s)

Pick:

Qty Part number Description Batch

2 D2856-600(Cut to 10.090") Abrasion Strip

326650 ml 07 07 04

24.0

D28961

Support



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part number Description Batch

1 D2896-1

Support

30200

07-07-12

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Mfg / Design Mgr	Approval QC Inspector

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Design Mgr	Approval QC Inspector
			Initial Design Mgr	Action Description Design Mgr	Sign & Date			

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Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: HIGH AFT X-TUBE 412

Job Number: 30186

Part Number: D412664203

Job Number:



Seq. #:

Machine Or Operation:

Description :

25.0

D31891

Chafing Shield



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D3189-1 Chafing Shield 31147 RT 07-07-09

26.0

MS2192028

Clamp(per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick:

Qty Part number Description Batch

4 MS21920-28 Clamp 15296/17562 RT 07-07-09

27.0

MS2192032

clamp(per MIL-DTL-8783C)



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

clamp(per MIL-DTL-8783C)

batch: 102931 RT 07-07-12

28.0

D2732

Rubber Extrusion



Comment: Qty.: 1.0290 f(s)/Unit Total : 1.0290 f(s)

Rubber Extrusion

Cut qty 2 5.80" long

qty part# description batch

2 D2732-058 rubber cushion 32894 RT 07-07-16

29.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

Assemble as per Dwg D412-664-203

Instal support with magnobond 6398 per dwg D412-664-203,
cure for 12hrs before packaging.

Time & date of application: 3:00 07-07-12

RT 07-07-12

W/O:		WORK ORDER CHANGES					
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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Design Mgr	Approval QC Inspector
			Initial Design Mgr	Action Description Design Mgr	Sign & Date			

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NOTE: Date & initial all entries

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User: Linda Lacelle

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: HIGH AFT X-TUBE 412

Job Number: 30186

Part Number: D412664203

Job Number:



Seq. #:

Machine Or Operation:

Description :

30.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

En 07/07/19 (X1)

31.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick Packing Kit

32.0

AN640A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Bolt

Batch: M103446 ✓

33.0

AN641A

Bolt



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Bolt

Batch: M101428 ✓

34.0

AN960JD616

Washer



Comment: Qty.: 18.0000 Each(s)/Unit Total : 18.0000 Each(s)

Washer

Batch: M103641 ✓

35.0

MS21042L6

Nut



Comment: Qty.: 6.0000 Each(s)/Unit Total : 6.0000 Each(s)

Nut

Batch: M101660 ✓

7/7/20 SP

36.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

C 20 7/07/20 (1) C 20 7/7/20 (1)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Mfg / Design Mgr	Approval QC Inspector

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			Initial Design Mgr	Action Description Design Mgr	Sign & Date			

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☐ No ☒ DQA: PD Date: 07/09/07

NOTE: Date & initial all entries

QA: N/C Closed: _____ Date: _____

Date: Friday, 05/01/2007 11:29:46 AM
User: Linda Lacelle

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: HIGH AFT X-TUBE 412

Job Number: 30186

Part Number: D412664203

Job Number:



Seq. #:

Machine Or Operation:

Description :

37.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D412-664-203

*****Ensure tube is not packaged if curing time is less than 12 hrs, see step 27 for application time & date

Time & date of packaging:

7/7/20 12-30 AM

Location:

PPP Rev:

G

38.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

10/21/23

Job Completion



11 10/21/23

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Mfg / Design Mgr	Approval QC Inspector

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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

NOTE: Date & initial all entries

QA: N/C Closed: _____ Date: _____

DART AEROSPACE LTD	Work Order: 30186
Description: Crosstube Assembly (412 High Aft)	Part Number: D412-664-243
Inspection Dwg: D412-664-243 Rev: B	Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.684	+0.005/-0.000	2.687	✓			
	2.748	+0.005/-0.000	2.751	✓			
	2.884	+0.005/-0.000	2.887	✓			
	3.019	+0.005/-0.000	3.021	✓			
	3.163	+0.005/-0.000	3.167	✓			
	3.308	+0.005/-0.000	3.312	✓			
	3.429	+0.005/-0.000	3.432	✓			
	2.990	+0.005/-0.000	2.992	✓			
	2.618	+0.005/-0.000	2.621	✓			
	0.200	+/-0.010	.200	✓			
	R0.063	+/-0.010	.063	✓			
	R0.500	+/-0.010	.500	✓			
	4.971	+/-0.001	4.971	✓			
SIDE B	2.684	+0.005/-0.000	2.687	✓			
	2.748	+0.005/-0.000	2.752	✓			
	2.884	+0.005/-0.000	2.883	✓			See attached
	3.019	+0.005/-0.000	3.023	✓			Notes
	3.163	+0.005/-0.000	3.167	✓			
	3.308	+0.005/-0.000	3.312	✓			
	3.429	+0.005/-0.000	3.432	✓			
	2.990	+0.005/-0.000	2.994	✓			
	2.618	+0.005/-0.000	2.622	✓			
	0.200	+/-0.010	.200	✓			
	R0.063	+/-0.010	.063	✓			
	R0.500	+/-0.010	.500	✓			
	4.971	+/-0.001	4.971	✓			
	124.09	+/-0.020	124.09	✓			

Measured by: BC	Audited by: MS	Prototype Approval:	N/A
Date: 07.01.07	Date: 07/01/22	Date:	N/A

Rev	Date	Change	Revised by	Approved
A	04.06.16	New Issue (P/O D412-664-203)	KJ/JLM	
B	06.03.09	Dwg Rev updated	KJ/JLM	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

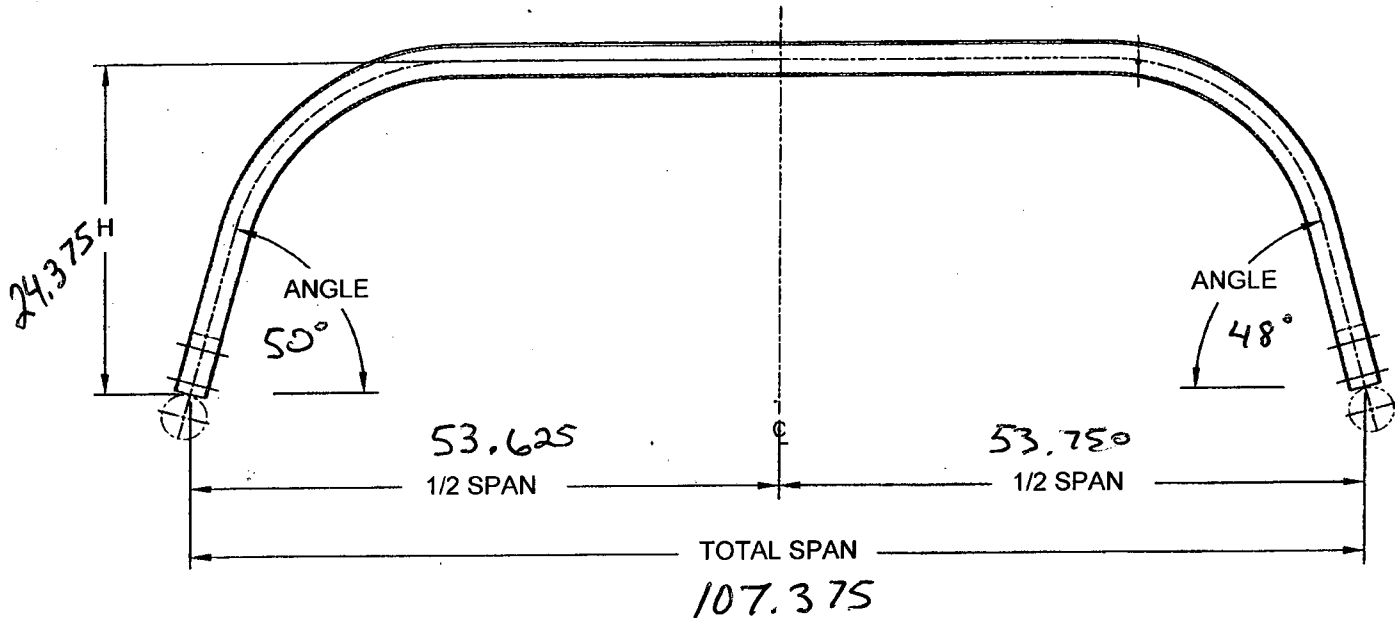
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Crosstube Bend Dimension Sheet



PART NUMBER: NH12664203

BATCH NUMBER: 30186

DRAWING: NH12664243 REVISION: C

H: 24.37

1/2 SPAN: 53.75

TOTAL SPAN: 107.44

ANGLE: 50°

QC 15: AK

DATE: 07/03/08

QTY: ①

Fit in table jig

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

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DESIGN PH	DRAWN BY PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED PH	APPROVED PH	DRAWING NO. D412-664-243	REV. C SHEET 1 OF 3
DATE 06.10.27		TITLE CROSSTUBE ASSEMBLY (412 HI AFT) NTS	
A	01.10.17	NEW ISSUE	
B	05.02.04	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	
C	06.10.27	REMOVE D2856-600-1087, ADD D2732-058 & MAGNOBOND 6398 MS21920-32 WAS MS21920-30	

RELEASED
06-4-28 **PH**

PARTS LIST:

Qty	Part Number	Description
X	D412-664-243	CROSSTUBE ASSEMBLY (412 HIGH AFT)
1	D6009-129	CROSSTUBE
2	D2732-058	RUBBER CUSHION
1	D2896-1	SUPPORT
2	D2856-600-1009	ABRASION STRIP
4	MS21920-28	CLAMP
2	MS21920-32	CLAMP
2	D3189-1	CHAFING SHIELD
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

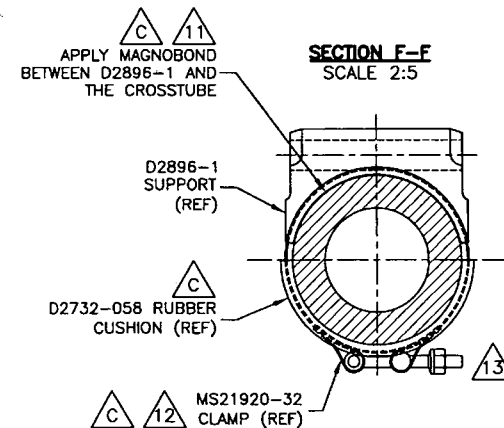
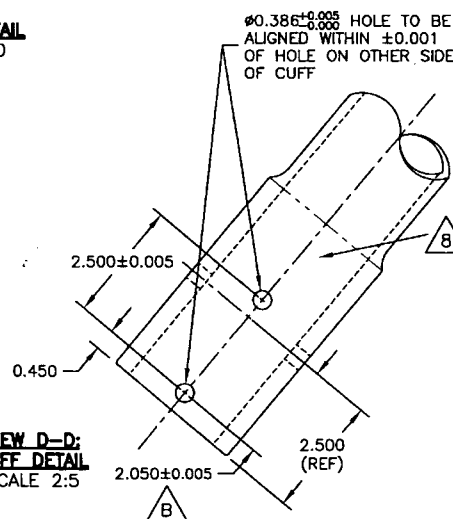
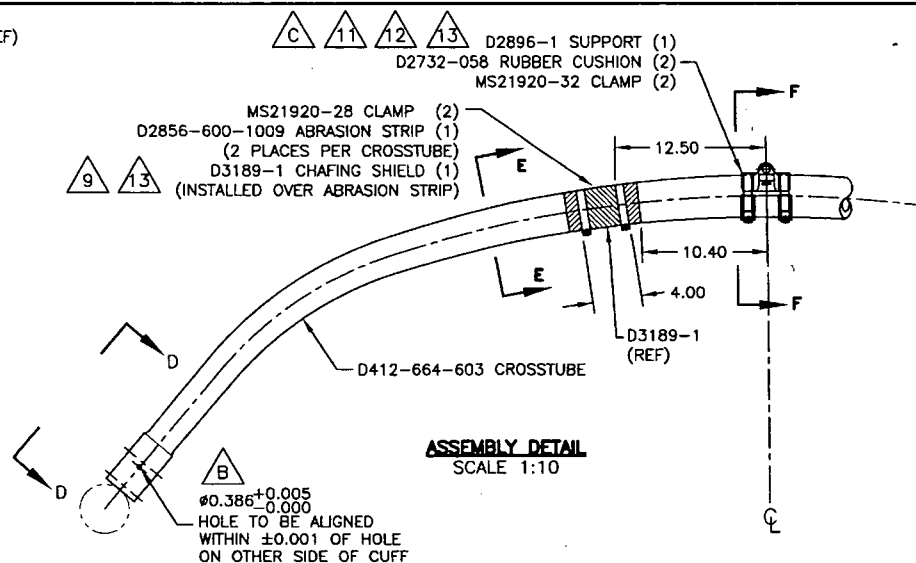
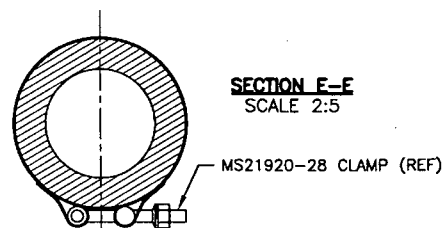
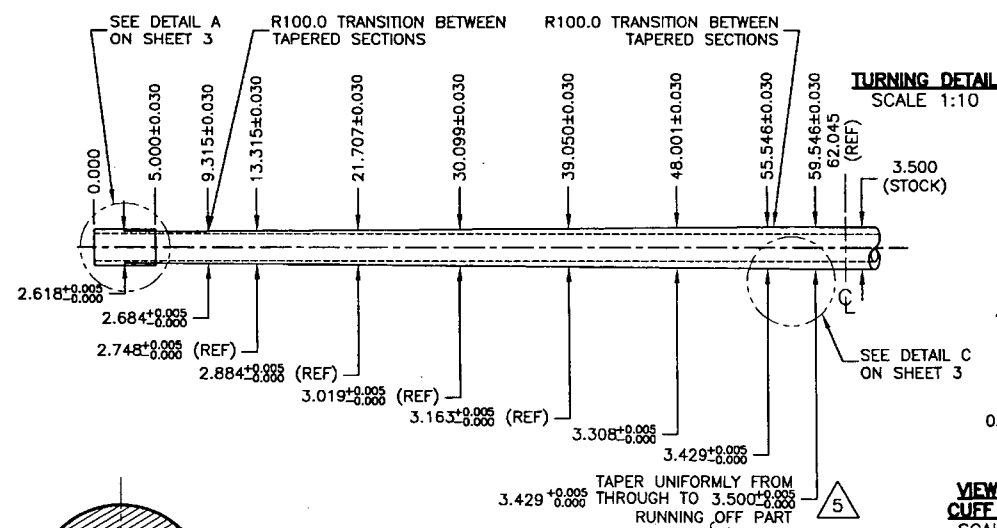
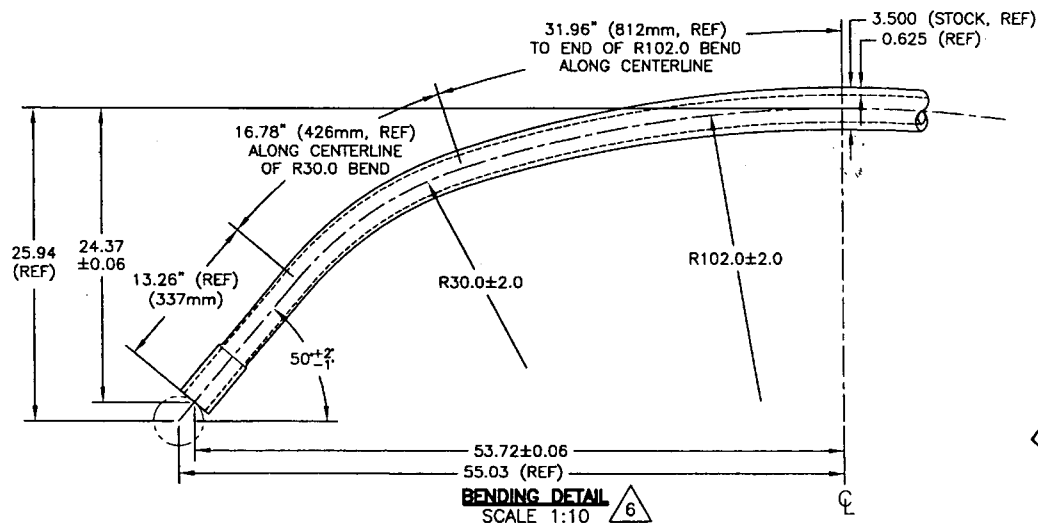
GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6009-129
FINISHED LENGTH = 124.09±0.020
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-600-1009 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR PACKAGING.
- 12) INSTALL MS21920-32 CLAMPS WITH D2732-058 RUBBER CUSHIONS TO SECURE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 30186

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RELEASED

06-11-28

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DESIGN
PH
CHECKED
PH
DATE
06.10.27

DRAWN BY
B
APPROVED
H

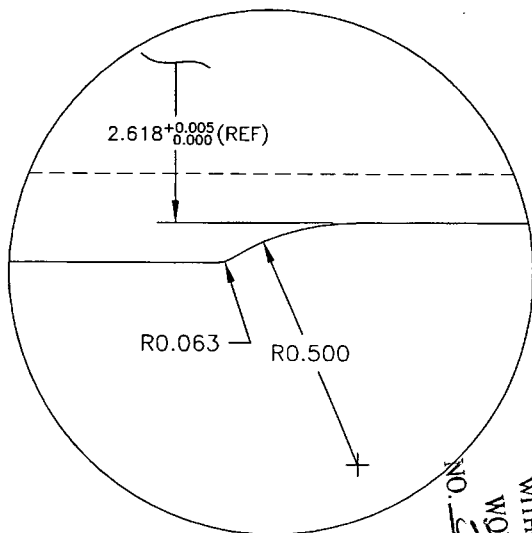
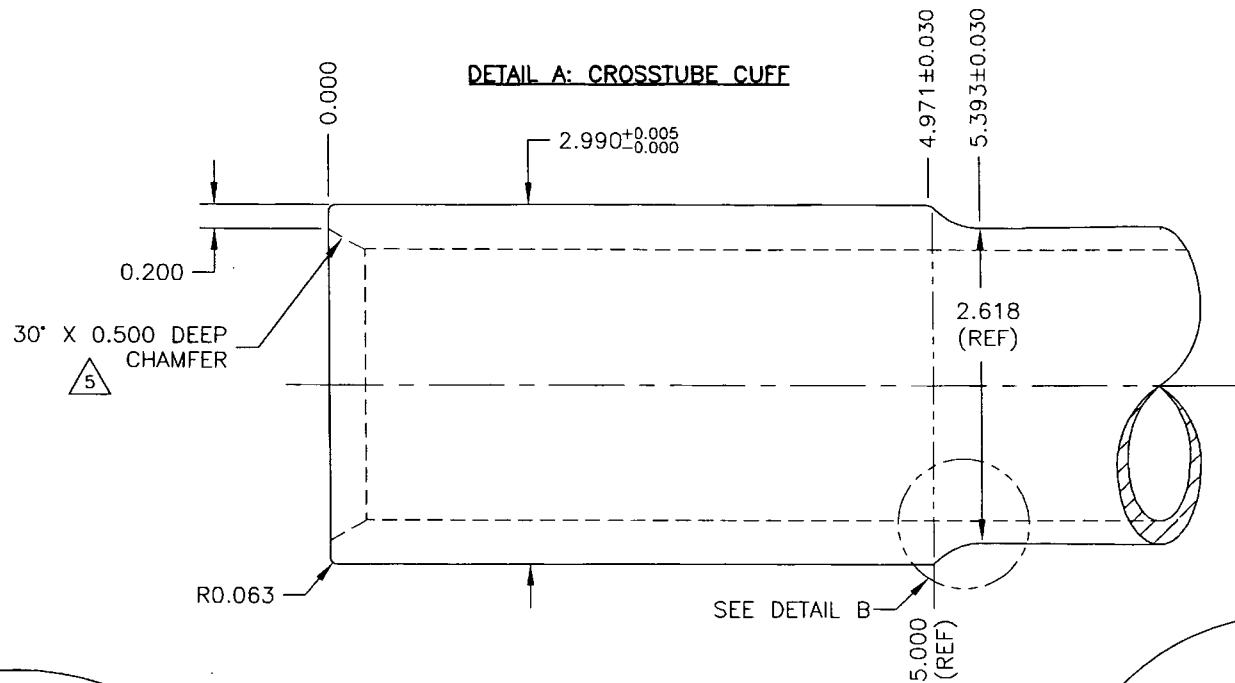
DART DART AEROSPACE LTD.
WARRICKSURY, ONTARIO, CANADA

DRAWING NO.
D412-664-243
TITLE
CROSSTUBE ASSEMBLY (412 HI AFT)
REV. C
SHEET 2 OF 3
SCALE
1:10

NO. 301860
WORK ORDER
SUBJECT TO ATTENDANT
WITHOUT NOTICE
UNCONTROLLED COPY
ENGINEERING
RETURN TO
SHOP COPY

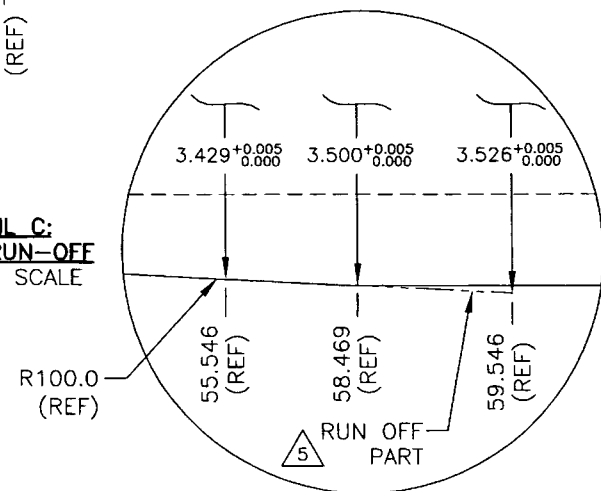
RELEASED
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DETAIL A: CROSSTUBE CUFF



DETAIL B: CUFF
TRANSITION
SCALE 4:1

DETAIL C:
TAPER RUN-OFF
NOT TO SCALE



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DATE
06.10.27

DRAWN BY
B
APPROVED
H

DART DART AEROSPACE LTD.
HAWKESBURY, ONTARIO, CANADA

DRAWING NO.
D412-664-243

TITLE
CROSSTUBE ASSEMBLY (412 HI AFT)

REV. C
SHEET 3 OF 3
SCALE
1:1

SECTION	Cross tube	Damage Tolerance	O.D. (in)	I.D. (in)	Area (in ²)	Inertia (in ⁴)
A-A	Bell/AA Aft	0.000	3.500	2.250	5.645	6.108
	Bell/AA Aft w/ dam. tol.	0.000			5.645	6.077
	Dart Aft	0.000	3.500	2.250	5.645	6.108
	Dart Aft w/ dam. tol.	0.015			5.501	5.845
B-B	Bell/AA Aft	0.000	3.314	2.250	4.650	4.663
	Bell/AA Aft w/ dam. tol.	0.000			4.650	4.663
	Dart Aft	0.000	3.308	2.250	4.618	4.620
	Dart Aft w/ dam. tol.	0.015			4.417	4.410
C-C	Bell/AA Aft	0.000	3.169	2.250	3.911	3.693
	Bell/AA Aft w/ dam. tol.	0.015			3.881	3.617
	Dart Aft	0.000	3.163	2.250	3.881	3.655
	Dart Aft w/ dam. tol.	0.015			3.680	3.452
D-D	Bell/AA Aft	0.000	3.025	2.250	3.211	2.852
	Bell/AA Aft w/ dam. tol.	0.015			3.181	2.784
	Dart Aft	0.000	3.019	2.250	3.182	2.820
	Dart Aft w/ dam. tol.	0.015			2.981	2.657
E-E	Bell/AA Aft	0.000	2.890	2.250	2.584	2.166
	Bell/AA Aft w/ dam. tol.	0.012			2.560	2.116
	Dart Aft	0.000	2.872 *	2.250	2.502	2.082
	Dart Aft w/ dam. tol.	0.012			2.307	1.904
F-F	Bell/AA Aft	0.000	2.754	2.250	1.981	1.566
	Bell/AA Aft w/ dam. tol.	0.012			1.957	1.520
	Dart Aft	0.000	2.748	2.250	1.955	1.541
	Dart Aft w/ dam. tol.	0.012			1.759	1.368
G-G	Bell/AA Aft	0.000	2.690	2.250	1.707	1.312
	Bell/AA Aft w/ dam. tol.	0.012			1.683	1.269
	Dart Aft	0.000	2.684	2.250	1.682	1.289
	Dart Aft w/ dam. tol.	0.012			1.486	1.118
H-H	Bell/AA Aft	0.000	2.620	2.250	1.415	1.055
	Bell/AA Aft w/ dam. tol.	0.012			1.391	1.014
	Dart Aft	0.000	2.618	2.250	1.407	1.048
	Dart Aft w/ dam. tol.	0.012			1.212	0.879
J-J	Bell/AA Aft	0.000	3.000	2.250	3.093	2.718
	Bell/AA Aft w/ dam. tol.	0.038			3.017	2.547
	Dart Aft	0.000	2.990	2.250	3.045	2.665
	Dart Aft w/ dam. tol.	0.038			2.798	2.367

* WAS 2.884

SECTION **	Cross tube	Bending Ultimate (lb*in)	Bending Yield (lb*in)	Tension Ultimate (lb)	Tension Yield (lb)	Shear Ultimate (lb)
A-A	Bell/AA aft w/ DT	229208	194480	372573	316123	237092
	Dart aft w/ DT	257186	220445	423592	363079	225549
	Margin of Safety	0.12	0.13	0.14	0.15	-0.05
B-B	Bell/AA aft w/ DT	185722	157582	306876	260379	195285
	Dart aft w/ DT	205296	175968	340111	291523	181098
	Margin of Safety	0.11	0.12	0.11	0.12	-0.07
C-C	Bell/AA aft w/ DT	150671	127842	256168	217355	163016
	Dart aft w/ DT	168076	144065	283367	242886	150884
	Margin of Safety	0.12	0.13	0.11	0.12	-0.07
D-D	Bell/AA aft w/ DT	121466	103062	209933	178125	133594
	Dart aft w/ DT	135559	116194	229531	196741	122218
	Margin of Safety	0.12	0.13	0.09	0.10	-0.09
E-E	Bell/AA aft w/ DT	96650	82006	168937	143340	107505
	Dart aft w/ DT	102101	87515	177622	152248	94578
	Margin of Safety	0.06	0.07	0.05	0.06	-0.12
F-F	Bell/AA aft w/ DT	72863	61823	129148	109580	82185
	Dart aft w/ DT	76653	65703	135478	116124	72138
	Margin of Safety	0.05	0.06	0.05	0.06	-0.12
G-G	Bell/AA aft w/ DT	62261	52827	111087	94256	70692
	Dart aft w/ DT	64153	54988	114454	98103	60943
	Margin of Safety	0.03	0.04	0.03	0.04	-0.14
H-H	Bell/AA fwd w/ DT	51075	43336	91820	77908	58431
	Dart fwd w/ DT	51690	44305	93291	79964	49675
	Margin of Safety	0.01	0.02	0.02	0.03	-0.15
J-J	Bell/AA fwd w/ DT	112069	95088	199089	168924	126693
	Dart fwd w/ DT	121931	104512	215450	184672	114720
	Margin of Safety	0.09	0.10	0.08	0.09	-0.09

Except from
SR-D412-664-Rev 13,
Tables 1 & 4.
WITH O.D. OF 2.872 AT
TUBE LOCATION THAT IS
Ø 2.884 TO 0.005 ON DWG
D412-664-243 Rev. C, ALL
MARGINS ARE STILL POSITIVE,
THREE-FOLD TUBE IS SUFFICIENTLY
STRONG

07.08.10



HeathAir

INTERNATIONAL (1991) INC.

681 Ave. Lepine, Dorval, Québec H9P 1G3
Tél.: (514) 636-1000 • Fax: (514) 636-0031

W.O. N° 36580

A.M.O. Number: 46/90

NON-DESTRUCTIVE TESTING REPORT

AIRCRAFT / COMPONENT INFORMATION

REGISTRATION:

MODEL/TYPE:

SERIAL NUMBER:

TOTAL HR/LDG:

OPERATED BY:

BASED AT:

INSPECTION REQUIREMENTS

Carry out FPI of (7) cross tubes (external surface) as per ASTM E-1417-05 and the Dart QSI 038, Section 4.1.1 (on file at client) - parts delivered to HeathAir.

Qty (1) P/N D212-664-101 S/N B31356
Qty (1) P/N D412-664-203 S/N B30186
Qty (2) P/N D212-664-201 S/N's B30423 and B30421.
Qty (3) P/N D412-664-245 S/N's B32445, B32447 and B32446.

☐ RADIOGRAPHY

☐ ULTRASONIC

☒ PENETRANT

☐ MAGNETIC PARTICLE

☐ EDDY CURRENT

INSPECTION REPORT

Fluorescent penetrant inspection was performed in accordance with the above requirements on (7) cross tubes.

Note: A Level 3 penetrant was substituted for the requested Level 2 (3 is more sensitive)
Ardrox 970P25E Batch #04B503.

(7) cross tubes inspected. (7) PASSED / (0) FAILED.

THE MAINTENANCE DESCRIBED ABOVE HAS BEEN PERFORMED IN ACCORDANCE WITH
THE APPLICABLE STANDARDS OF AIRWORTHINESS

INSPECTED BY: 

DATE June 06, 2007

INSPECTION
STAMP(S) 

CUSTOMER INFORMATION

CUSTOMER: Dart Aerospace

P.O. NUMBER

PO 00003908

Linda Lacelle

ADDRESS:

CONTACT NAME:

LABOUR

@

\$

MATERIALS

@

TRAVEL EXPENSES

@

GST

HOTEL EXPENSES

@

PST

INVOICE NO.

TOTAL \$

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